REMARKS/ARGUMENTS

Claims 13-44 are pending.

Claims 1-12 have been cancelled.

Claims 13 to 20 correspond to original Claims 1 to 8, respectively. Claims 21 to 44 correspond to original Claims 10 to 12. The original Claim 9 has been deleted. Additional support for the amendments is found in the claims and specification (e.g., pages 5-7, 12, 14-16, and the Examples), as originally filed.

No new matter is believed to have been added.

Claims 5, 6, 7, and 8 are rejected under 35 U.S.C. 112, second paragraph. Claims 5, 6, 7, and 8 have been cancelled. In Claims 13-20, several process steps have been made clear. Further, in Claims 17-20, heat treatment by discharge plasma performed on carbon nanotubes, heat treatment by plasma discharge performed on the knead-dispersed material, and sintering by discharge plasma performed on the knead-dispersed material have been clearly distinguished from one another. The heat treatment by discharge plasma performed on the knead-dispersed material is clearly different from the sintering by discharge plasma in that the knead-dispersed material is heated without being sintered with less pressing force.

The carbon nanotube heat treatment carried out in Claims 14, 16, 18, and 20 is not a mere treatment by discharge plasma, but uses a particular technique wherein the carbon nanotubes are clamped between punches in a die and pulse current is allowed to flow therethrough.

Also, Claims 13-20 have been amended to calamity the term "direct current pulse current" which is "pulse current".

Thus, it is believed that the claims are clear. Applicants request that the rejection be withdrawn.

Claims 1, 5, 9, and 10-12 are rejected under 35 U.S.C. § 103(a) over Yoichi et al., JP 10088256 (JP '256) and Shotaro et al., JP 2000128648 (JP '648).

Claims 2 and 6 are rejected under 35 U.S.C. § 103(a) over Yoichi et al., JP 10088256 (JP '256), Shotaro et al., JP 2000128648 (JP '648), and Jung et al., App. Surf Sci., 193:129-137 (2002).

Claims 3-4 and 7 are rejected under 35 U.S.C. § 103(a) over Yoichi et al., JP 10088256 (JP '256), Shotaro et al., JP 2000128648 (JP '648), and Reddy et al., J. Math. Sci., 37:929-934 (2002).

Claim 8 is rejected under 35 U.S.C. § 103(a) over Yoichi et al., JP 10088256 (JP '256), Shotaro et al., JP 2000128648 (JP '648), Jung et al., App. Surf Sci., 193:129-137 (2002), and Reddy et al., J. Math. Sci., 37:929-934 (2002).

The rejections are traversed because the combination of the references does not describe or suggest:

(a) sintering the knead-dispersed material obtained by kneading and dispersing (i) a ceramics powder or a metal powder or a mixture of both said powders and (ii) long-chain carbon nanotubes, by discharge plasma by allowing pulse current to flow while pressing the knead-dispersed material between punches in a die;

(b) heating carbon nanotubes by discharge plasma by allowing pulse current to flow while clamping the carbon nanotubes between punches in a die with a pressure of 10 MPa or less, and

(c) subjecting the knead-dispersed material to a heat treatment by discharge plasma without sintering by allowing pulse current to flow therethrough while clamping the knead-dispersed material between punches in a die with a pressure of 10 MPa or less.

(c) One would not have been motivated to modify the production of the composite material of JP '256 by applying sintering of JP '648 by discharge plasma that allows pulse

current to flow while pressing the composite material between punches in a die to achieve the claimed methods because JP '648 and JP '256 describe different materials and achieve different goals.

(d) One would not have reasonably expected to successfully achieve properties of the carbon nanotube composite obtained by the claimed method by combining the composite material of JP '256 and sintering of JP '648 because sintering of JP '648 is specifically adjusted to a powder raw material, while the composite material of JP '256 comprises nanotubes.

Regarding Claim 13 corresponding to Claim 1, JP '256 discloses a method of producing composite sintered material of a metal powder and carbon nanotubes (abstract). However, the sintering method is not a discharge plasma method. Further, the carbon nanotubes are required to function as a reinforcing material.

JP '648 discloses that a discharge plasma method is effective for the solidification by sintering of a metal powder or a ceramics powder (abstract). However, it is not suggested that the discharge plasma method is effective for solidification by sintering composite materials comprising carbon nanotubes.

One would not have been motivated to modify the production of the composite material of JP '256 by applying sintering of JP '648 by discharge plasma that allows pulse current to flow while pressing the composite material between punches in a die to achieve the claimed methods because JP '648 and JP '256 describe different materials and achieve different goals. Specifically, JP '256 describes a composite material comprising a powder reinforced by carbon nanotubes ([0013]-[0021]), while the method of JP '648 is specifically adjusted to a raw powder material and producing a homogeneous sintered article (abstract).

One would not have reasonably expected to successfully achieve properties of the carbon nanotube composite obtained by the claimed method by combining the composite

material of JP '256 and sintering of JP '648 because sintering of JP '648 is specifically adjusted to a powder raw material, while the composite material of JP '256 comprises nanotubes.

More specifically, in the method of sintering metal powders or ceramic powders by discharge plasma as in JP '648, discharge plasma current is generated only between powders, while in the claimed method (as in Claim 13), the discharge plasma current is generated also between a powder and a carbon nanotube due to the existence of the carbon nanotubes between the powder particles, and impurities tend to disappear. The thermal conductivity is improved thereby. In the claimed method in which the carbon nanotubes exist in the powder, the proportion of impurities inhibiting thermal conduction is extremely low compared to the composite of JP '648 in which the carbon nanotubes are not included.

The effect concerning thermal conductivity is not describe or suggested in JP '648 in which the carbon nanotube are not included and is also not suggested in JP '256 in which the carbon nanotube is used as a reinforcing material.

Jung et al. do not cure the deficiency.

In Claims 14 and 16, a heat treatment by discharge plasma is previously performed on the carbon nanotube to be used. The claimed carbon nanotube heat treatment uses a special method wherein the carbon nanotube is clamped between punches in a die with pressure of 10 MPa or less and the pulse current is allowed to flow therethrough.

JP '648 does not disclose the carbon nanotube heat treatment.

Jung et al. describe treating the carbon nanotube by discharge plasma, but the specific method thereof is CVD or Field Emission.

The discharge plasma on the carbon nanotube in Claims 14 and 16 is applied through the pulse energization of high current directly performed on the carbon nanotube, which is different from CVD, and does not apply an electric field, as in Field Emission, and, therefore,

the claimed nanotube heat treatment is thus extremely different from the Jung et al. technique and effect.

Claims 15 and 16 are directed to a method comprising wet-dispersing the powder and carbon nanotubes using a dispersing agent. Using the dispersing agent in itself is described in Reddy et al.; however, irrespective of whether using the dispersing agent is known or not, manufacturing a composite material of a powder and a carbon nanotube using discharge plasma sintering is not described.

Further, in Claims 17 to 20, the knead-dispersed material is pretreated before sintering. Specifically, the knead-dispersed material is subjected to a heat treatment by discharge plasma without sintering it by allowing pulse current to flow therethrough while clamping the knead-dispersed material between punches in a die with a pressure of 10 MPa or less. The cited documents do not describe or suggest the claimed discharge plasma treatment of the knead-dispersed material that is performed before sintering and is different from sintering.

Thus, JP '256 and JP '648 alone or in combination with Jung et al. and/or Reddy et al. do not make the claimed method obvious.

Applicants request that the rejection be withdrawn.

Applicants submitted an IDS on July 21, 2006. Although the Examiner indicated on the bottom of the page citing seven Japanese documents that all references have been considered, the Examiner did not sign and date the IDS next to "Examiner" and "Date Considered" at the bottom of the form. **Applicants request that the Examiner provides Applicants with a signed and dated IDS.**

A Notice of Allowance for all pending claims is requested.

Respectfully submitted,

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